There is apparently no specificity to bismuth in the treatment of warts. This drug acts favorably in about the percentages that other drugs, such as neoarsphenamin and sulpharsphenamin do.

I can appreciate the effect on the observer who witnesses the clearing of warts, following the use of bismuth. It is indeed spectacular. This, however, is also true in the use of other drugs as well as age-old witchcraft. It would appear now specific.

There appears to be a mechanism as yet unexplained which accounts for the clearing of verrucae as well as their development.

Doctor Lurie should be complimented upon adding another agent, even though but partially effective, which adds to the patient's chance of recovery.

FEMALE BLADDER INJURIES INCIDENT TO SURGERY *

By WILLIAM E. STEVENS, M. D.
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DISCUSSION *by Robert V. Day, M. D., Los Angeles; Lionel P. Player, M. D., San Francisco; Harry W. Martin, M. D., Los Angeles.*

INJURIES of the female bladder incident to surgery are probably more common than would be supposed from the infrequency with which cases are reported in the literature or are recorded on hospital charts. I found a record of but five cases of accidental injury of the bladder during operation in 53,254 admissions to the San Francisco Hospital. Hamer [1] quotes Graves,[2] who stated that only two cases occurred during 19,215 admissions to the Carney Hospital. This accident occurred three times during 1,086 pelvic operations in Stanford Hospital. Only those cases in which the bladder was incised or torn are included in these three series of cases. This complication is occasionally unavoidable, and has occurred in the experience of many competent surgeons.

OPERATIONS RESPONSIBLE FOR BLADDER INJURY

Injury of the bladder occurs most frequently during hysterectomy, salpingectomy, and oöphorectomy. It has also followed intravesical instrumentation, fulguration, and distention of the bladder with air or fluids, especially if the wall is already weakened by some pathologic condition. Curettage of the uterus, cesarean section, and instrumental delivery have likewise been responsible for serious injury to the bladder in many instances. G. Muller [3] reported a case in which, in addition to extensive tearing of the posterior bladder wall, the organ had also been torn away from the symphysis pubis, and the right ureter seriously damaged by a curette during an operative abortion. Damage to this organ is not uncommon when a portion is included in a hernial sac.

TYPES OF INJURY

Injuries are not limited to incisions, tears, punctures, ruptures or inclusion by sutures. Traumatism of the bladder and its attachments by rough handling, and necrosis following pressure from retractors, are occasionally responsible for postoperative symptoms. Later, distortion and displacement of the bladder, due to scar tissue resulting from the repair of vesicovaginal fistulas and to pressure or adhesions, are often responsible for interference with circulation, decreased bladder capacity and partial retention of urine with subsequent infection. Bladder symptoms are common following the transposition operation on the uterus; and this procedure has been abandoned by many surgeons. The most common sequelae of bladder injury are vesicovaginal, and abdominal fistulas and extravasation of urine.

REPORT OF CASES

CASE 1.—A married woman, fifty years of age, complained of attacks of pain in the left lumbar region, nausea and vomiting, following a transposition operation on the uterus six months previously. The bladder had been irrigated on numerous occasions because of pus in the urine. Persistence of her symptoms had caused her to return to the hospital several times for short periods. The urine contained an enormous number of pus cells. Cystoscopic investigation revealed an inflamed bladder mucosa, elevation of the vesical orifice, hypertrophy of the trigone, and a deep bas fond. A cystogram (Fig. 1) showed a large sacculation protruding from the lower right posterior wall of the bladder, and a pyelogram showed marked hydronephrosis with almost complete destruction of the left kidney. Improvement followed nephrectomy.

CASE 2.—A vesicovaginal fistula followed a forceps delivery. An unsuccessful attempt at intravesical repair was made one year later. A second intravesical attempt at repair during the following year was successful. Three months later a ventral hernia developed. This was repaired. A cystogram (Fig. 2) showed marked postoperative distortion of the bladder.

CASE 3.—A patient entered the hospital complaining of profuse intermittent bleeding from the bladder, beginning after sexual trauma seven weeks previously. Examination also revealed an abdominal sinus as well as several other sinuses in the gluteal region. She had undergone numerous operations, including suspension of the uterus and a bilateral oöphorectomy. A cystogram (Fig. 3) showed marked distortion of the bladder and a decrease in its capacity. The bleeding ceased a few days after the patient entered the hospital.

SYMPTOMS AND DIAGNOSIS

The female bladder is more sensitive to direct and reflex influences than that of the male, and disturbances of urination are very common following gynecologic procedures. Partial or complete retention of urine is usually found immediately after pelvic operations in this sex.[4] The symptoms associated with bladder injury are not infrequently puzzling and the diagnosis uncertain. This applies especially to those cases in which the injury has not been detected at the time of the original operation, and to those in which the injury has been discovered and the bladder wall apparently satisfactorily repaired.

REPORT OF CASES

CASE 4.—A hysterectomy was performed by a competent surgeon because of a large uterine fibroid. The bladder wall was thin and, with the peritoneum, closely adherent to the fibroid uterus, which extended upward to the umbilicus. In attempting to separate the bladder wall from the tumor, the base of the former organ was torn. The tear was closed with a continuous catgut suture. Six days later the patient complained of a slight cough, tenderness along the

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* Read before the Urology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

Fig. 1.—Distortion of the bladder following an interposition operation of the uterus.

Fig. 2.—Marked distortion of the bladder following two operations for repair of a vesico-vaginal fistula.

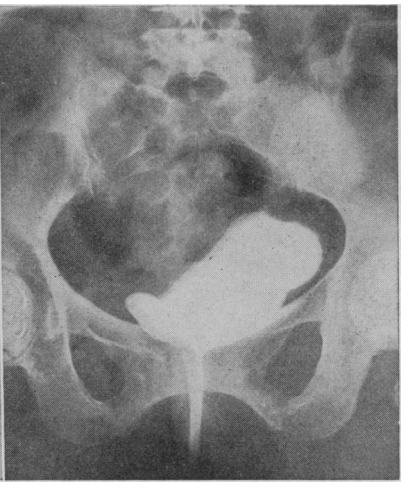

Fig. 3.—Marked distortion of the bladder following suspension of the uterus and bilateral oöphorectomy.

lower right costal margin anteriorly, and some pain on inspiration at the base of the right lung. Dullness on percussion, distant breath sounds, and some very fine râles were heard over this area. A diagnosis of pneumonia was made. Two days later the tenderness was more severe, some swelling was apparent in the kidney region, and the patient also complained of burning, frequent urination and pain in the right groin, worse on voiding. A catheterized specimen of bladder urine contained a large number of pus cells. Two hundred and forty cubic centimeters of residual urine were found. Cystoscopy revealed marked inflammation and edema of the bladder mucosa. The right ureteral orifice was not visible. Indigocarmin did not appear on either side within twenty-five minutes after intravenous injection. Operation was advised, but refused by the patient. Her condition gradually became worse, and one week later consent to operation was obtained. Following an oblique right lumbar incision, about 250 cubic centimeters of thick foul-smelling pus were evacuated. No pus was found inside the fatty capsule of the kidney. Some urine escaped through the wound for about six weeks after the operation. It was now possible to catheterize the right as well as the left ureter. The right kidney urine contained an occasional pus cell; the left was microscopically negative. Cultures from both showed colon bacilli. The patient made an excellent recovery after a prolonged convalescence.

* * *

Case 5.—A patient seen in consultation some time ago stated that urine had dribbled from her urethra since the removal of an abdominal tumor one and a half years previously. Examination revealed a vesico-vaginal fistula and urine dribbling from the vagina rather than from the urethra.

Tenderness in the suprapubic region, frequent urination, retention of urine, dysuria, and hematuria are common symptoms following most types of bladder injury. These symptoms are more apt to occur in the presence of a preoperative cystitis. The latter should receive appropriate treatment prior to gynecologic operations if possible. Extravasation of urine with subsequent infection is sometimes responsible for pain in the loins. This occasionally extends as high as the renal fossa in extraperitoneal injuries. When the opening is in the posterosuperior portion of the bladder, it usually communicates with the peritoneal cavity, and abdominal rigidity, as well as other symptoms of peritonitis such as nausea and vomiting, soon appear, especially if the urine is infected. Shifting abdominal dullness, due to urine in the peritoneal cavity, can sometimes be detected.

Intravenous urography is often a valuable diagnostic procedure when bladder injury is suspected. If this is not feasible, good cystograms may be obtained following the oral administration of sodium iodid as suggested by Osborne, Sutherland, Scholl, and Rountree [5] in 1923.

The advisability of injecting fluids into the bladder as a diagnostic procedure is questionable. It is not justifiable unless the surgeon is prepared to operate immediately.

TREATMENT

Recovery usually follows repair of the damaged bladder wall if detected at the time of injury. Later, if the symptoms are suggestive of bladder injury, or when in doubt, exploratory laparotomy is advisable. Delay in operating when the bladder opening is extraperitoneal, at best retards convalescence and often results in intense suffering. Intraperitoneal injury is usually rapidly fatal without operation. It may be permissible to postpone operation when there is sufficient drainage through an abdominal, rectal or vaginal fistula. The bladder wall should be closed with at least two rows of sutures, the first or deepest sutures being interrupted and including the entire wall with the exception of the mucosa. The other sutures may be continuous. A retention catheter should be inserted through the urethra and a urinary antiseptic given internally. If it is necessary to suture the bladder wall in the vicinity of the ureters, constriction of these organs should be avoided.

In the presence of extravasation of urine, free drainage is of the greatest importance.

The conditions following some types of bladder injury are often especially resistant to treatment. Many annoying postoperative symptoms would be avoided if infected bladders were appropriately treated prior to pelvic surgery.

REPORT OF CASES

Case 6.—A large rent was made in the fundus of the bladder during a hysterectomy and bilateral salpingectomy and oöphorectomy. It was closed with a

double layer of chromic sutures. The abdominal wall was then closed without drainage. A profuse mucoid discharge appeared nine days later. The wound was drained, and after a period of two weeks, or twenty-four days after the operation, it had completely closed.

CASE 7.—The bladder was accidentally opened during operation for excision of an old postoperative abdominal sinus and the freeing of a displaced uterus and bladder. It was closed with a double row of catgut sutures. A gutta-percha drain was placed in the space of Retzius. Two days later, however, urine escaped freely from the abdominal wound. Nineteen days after operation the wound had closed.

CASE 8.—An incision was accidentally made in the bladder during an operation for tightening of the sphincter, anterior colporrhaphy, proctopexy, and perineorrhaphy. The wound was closed with two purse-string sutures. A retention catheter was inserted. Convalescence was uneventful.

CASE 9.—The bladder wall was torn during a supravaginal hysterectomy. It was sutured and the abdominal wall was closed without drainage. The patient was catheterized every eight hours for the first four or five days. There were no postoperative symptoms.

CASE 10.—The bladder was incised during a hysterectomy. The injury was not detected. A vesicovaginal fistula followed. This closed after a third attempt at repair. One month later the patient entered the hospital complaining of pain in the left kidney region and bladder. Ureteral catheters encountered obstructions just inside both ureterovesical orifices, and x-rays showed several stones in the left kidney and a probable stone in the left ureter. The patient was uremic. The left ureter was opened, but no stone found. This was five and a half months after the last operation for repair of the fistula. Death occurred three weeks later. At autopsy, in addition to advanced bilateral pyonephrosis, both ureters were found obstructed by scar tissue resulting from the previous operations on the vesicovaginal fistula.

CASE 11.—In opening the peritoneum, preparatory to a right salpingectomy, oöphorectomy, the freeing of adhesions and an appendectomy, an incision about five centimeters in length was made into the bladder. This accident was apparently due to adhesions between the fundus of the uterus and the bladder, pulling the latter upward and forming a pouch. The incision in the bladder was immediately repaired and the abdominal wall closed without drainage. Convalescence was uneventful.

CASE 12.—In isolating the right uterine artery during a hysterectomy, salpingectomy and oöphorectomy, an incision about one centimeter in length was made in the bladder wall. This was immediately closed. Convalescence was uneventful.

COMMENT

Summary of the eight cases in which the bladder was accidentally torn or incised:

Bladder injury occurred during hysterectomy in two cases; during hysterectomy and salpingectomy, or oöphorectomy or hysterectomy and both salpingectomy and oöphorectomy in two cases; during salpingectomy and oöphorectomy in two cases; during tightening of the bladder sphincter, colporrhaphy, proctopexy, and perineorrhaphy in one case; and during operation for excision of a sinus following cesarean section and freeing of adhesions to uterus in one case.

The bladder wall was incised in five, and torn in three cases.

The injury was detected at the time of operation in seven cases, and not detected in one case.

The wound was sutured in the seven detected cases, one with drainage of the wound and one with drainage of the bladder through a retention catheter.

Convalescence was uneventful in four and prolonged in three cases. Death eventually resulted from the bladder injury in one case as a result of bilateral pyonephrosis due to scar tissue obstructing the ureters following several attempts at repair of a vesicovaginal fistula.

CONCLUSIONS

Urinary tract infection should receive appropriate treatment prior to operative procedures.

The bladder and its attachments should be handled carefully during pelvic surgery.

While no serious consequences follow repair of the bladder wall when detected at the time of operation in the majority of instances, exceptions to this rule are not uncommon.

Convalescence is shorter in patients in whom drainage is used.

Accidental operative injuries of the bladder are not infrequently responsible for prolonged convalescence, and they are occasionally fatal.

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DISCUSSION

ROBERT V. DAY, M. D. (1930 Wilshire Boulevard, Los Angeles).—Doctor Stevens has covered the subject so comprehensively and soundly that he has left little for anyone to add or contravert.

I wish especially to stress the effects on the bladder in many cases of the transposition or interposition operations. I have seen a number of unfortunate results following interposition operations done by men of undoubted skill, experience, and competency. Usually the base of the bladder is distorted, often presenting the picture of a mound pushing into the bladder base, accompanied with inflammatory infiltrate, ultimate infection and, in one case, superficial necrosis and bladder calculus.

In the operations of hysterectomy and on the adnexa, there are bound to be certain cases that tax the skill of the most experienced gynecologists, and no doubt an occasional accident involving bladder injury will continue to occur; and I think Doctor Stevens intends that these occurrences should be kept down to the minimum by exercising extreme care in their prevention. If immediately repaired and, for assurance sake, a very soft rubber drain is introduced down to the repair site, they almost invariably heal readily.

Injury produced by undue distention of the bladder with reflex retention postoperatively, mentioned casually by Doctor Stevens, is probably the most important trauma incident to pelvic (or other abdominal) surgery, and in the aggregate productive of infinitely

more dire results than all other forms of surgical trauma, from the standpoint of effects on the bladder. What is ordinarily called and supposed to be "catheter trauma" (almost always blamed on the nurse or the intern) is not catheter trauma at all, but the result of neglected postoperative overdistention. It occurs because the patient has not been catheterized soon enough, often enough, or over a sufficiently long period. That is to say, if there is any doubt about using the catheter, it should then always be used. Moreover, its use should not be discontinued just because the patient has begun to void. Such voiding is apt to be just overflow. In other words, intermittent catheterization should be continued until it has been actually demonstrated that the patient can empty the bladder when she voids. The method of instilling irritant drugs, such as mercurochrome solution, etc., on the theory (which sometimes works) that it will cause the patient to void, is a vicious and unjustified practice.

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LIONEL P. PLAYER, M. D. (384 Post Street, San Francisco).—Doctor Stevens' presentation is clear and concise. The small percentage of these surgical accidents reported is indeed surprising, especially in pelvic operations, where the proportion was three in 1,086 unselected cases. One could account for this fact in a measure, when he considers the extreme vascularity of the bladder wall, and might reasonably believe that small puncture wounds may be closed unknowingly; but sufficiently, when sutures or ligatures are applied to the bleeders, thereby preventing urine leakage.

Recognition at the time of injury, with proper suturing, drainage at and around the involved area, plus urethral indwelling catheter, is almost invariably effective and free from serious aftermath. The unrecognized cases due to any type of injury at operation, where the urine is infected or burrowing occurs along the deeper fascial planes with obscure symptoms, are serious, but respond to drainage. The great menace is presented when the peritoneal cavity is invaded with attendant peritonitis. In these cases the prognosis is grave, unless the condition is recognized and operated without delay.

In regard to the matter of retrograde cystographic studies, let me say that on several occasions I have not hesitated in accidental injuries to inject isotonic sodium iodid solution, if intravenous pyelocystographic media were not obtainable, with no ill effect.

Certain urinary antiseptics may be given intravenously when not tolerated by oral administration. The importance of free drainage by retention catheter, and at the site of injury, has been amply emphasized by the author.

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HARRY W. MARTIN, M. D. (6253 Hollywood Boulevard, Los Angeles).—As Doctor Stevens has stated, the incidence of bladder injury following operations is more frequent than has been reported.

A careful questioning of a number of gynecologists fixes the incidence of bladder injury at about one-half of one per cent. This may seem unusually large, but it will at least throw a light on the frequency.

I have seen two serious cases of necrosis of the bladder wall due to radium treatment of the rectum, and also two cases where the bladder was injured during a cautery operation in the abdomen.

As Doctor Stevens has stated, the majority of these cases have an uneventful recovery if the bladder is repaired immediately.

Too much stress cannot be made on the subject of appropriate treatment for urinary tract infections prior to surgery, and also gentle handling of the bladder and ureters during operations.

There have been seven cases in one of the large hospitals (five of whom were in males) where the bladder has been completely burned through by the use of the spark-gap current; and also several cases where the bladder has been ruptured, following the distention of the bladder with fluids by the syringe method.

TREATMENT OF NECK GLANDS IN CANCER OF LIP, TONGUE AND MOUTH*

A STUDY OF PRESENT-DAY PRACTICE

By OTTO H. PFLUEGER, M. D.
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WHEN the Cancer Commission of the California Medical Association was formed, it undertook as its first problem a survey of the field of cancer, with the preparation of statements of the minimum requirements for adequate diagnostic and therapeutic procedures; this information to be made available to the medical profession in California. To this end clinical committees were formed to assemble the data concerning the various fields of cancer. It was felt that differences of opinion would undoubtedly arise in committee discussions but that these could be overcome in the laying down of acceptable alternate procedures.

As stated in the report of the Committee on Skin and Mouth Tumors,† an irreconcilable difference of opinion arose over the proper procedure of treatment to be followed in dealing with the lymph node bearing area in lip and intra-oral epitheliomata. It was possible to reach agreement upon the treatment of the primary lesion by suggesting alternate acceptable methods of procedure, men preferring one method, agreeing, nevertheless, that other methods are acceptable. Agreement was also reached upon the care of palpable lymph node metastasis, the consensus of opinion being that adequate surgical removal, together with irradiation, is the procedure of choice when the glands are operable. However, upon the question of whether dissection of the neck should be performed in the absence of palpable metastatic glands, it was impossible to reach agreement.

One group felt strongly that in cancer sufficiently advanced to suggest the probable presence of metastasis, for example, in lip cancer when invasion has reached the underlying muscle, the gland-bearing area should always be cleaned out surgically even though no glands could be felt. On the other side, opinion was just as strong that conservative care offered equally good results—such care being prophylactic radiation to the node area, with careful observation of the patient. If a node becomes palpable, dissection of the neck should be performed.

In the face of such irreconcilable difference of opinion, the Commission undertook to ascertain the present-day practice of cancer authorities throughout the world. Questionnaires were sent to forty surgeons, radiologists, dermatologists, and cancer clinics in Europe and America, to which thirty responses were received—constituting, we believe, a fair number for the basis of this discussion.

A questionnaire at best is not a perfect means of obtaining information, for the answering of

* Being a report by the secretary of the Committee on Professional Information of the California Medical Association, Cancer Commission.

† CALIFORNIA AND WESTERN MEDICINE, Vol. XXXIX, No. 2, p. 136, August, 1933.